

CLAIMS

What is claimed is:

1. A method of extracting SPICE parameters and performing a SPICE calculation for a partially depleted SOI MOSFET formed on an SOI substrate, consisting essentially of:

estimating an unmodeled body current to be zero; and

treating information regarding a steady state during circuit operation as macro parameters;

whereby an extraction of parameters relating to the body current and a calculation that finds the steady state during circuit operation are omitted.

2. A method of performing a SPICE calculation for a partially depleted SOI MOSFET formed on an SOI substrate consisting essentially of:

estimating a body current to be zero; and

treating information regarding a steady state during circuit operation as macro parameters;

whereby a procedure for performing a calculation that finds the steady state during circuit operation is omitted.

3. A method of performing a SPICE calculation and device simulation for a partially depleted SOI MOSFET formed on an SOI substrate comprising:

increasing an input signal cycle and one of an output load capacitance and an output load resistance by a ratio "X";

finding an initial value "Y" of a total body charge at which there is zero fluctuation in the total body charge after one input signal cycle; and

extrapolating a value of Y for when X=1 by expressing Y as a function of X;

whereby a steady state during circuit operation of a partially depleted SOI MOSFET is found.

4. A method of performing a SPICE calculation and device simulation for a partially depleted SOI MOSFET formed on an SOI substrate comprising:

increasing a cycle of trial pulses that imitate actual circuit operation by "X" times to extend the trial pulses with similarity waveforms;

finding an initial value "Y" of a total body charge at which there is zero fluctuation in the total body charge after one trial pulse cycle; and

extrapolating a value of Y for when X=1 by expressing Y as a function of X;

whereby a steady state during circuit operation of a partially depleted SOI MOSFET is found.

5. A method of performing a SPICE calculation for a partially depleted SOI MOSFET formed on an SOI substrate comprising:

setting special values with a first magnitude for calculation for a body;

setting values with a second magnitude that is used in a calculation for nodes aside from the body, the first magnitude being lower than the second magnitude; and

utilizing the special values and the values as error tolerance parameters used as a convergence criterion.

6. A method of performing a SPICE calculation for a partially depleted SOI MOSFET whose effective channel width is known comprising:

providing the SOI MOSFET with a body terminal;

finding a body potential which is a value at which a drain current per unit effective channel width matches that in a steady state of a floating body

partially depleted SOI MOSFET whose effective channel width is known, the body potential being found by one of direct measurement and interpolation/extrapolation;

measuring and modeling a body potential dependence of drain current characteristics in a steady state for a partially depleted SOI MOSFET;

tabularizing the body potential; and

using the tabularized body potential in analysis of the steady state for the floating body partially depleted SOI MOSFET.